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Title: Postoperative Analgesic Efficacy of Epidural Ropivacaine Versus Ropivacaine With Tramadol In Adults Undergoing Abdominal Surgeries Under General Anaesthesia

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I. Introduction:

The main issue following abdominal procedures is postoperative discomfort. According to evidence, invasiveness of the surgery affects how the immune system is suppressed and how much of that suppression occurs. Good postoperative analgesia can stop this harmful effect, lowering the risk of infection and morbidity in the immediate aftermath of surgery (1). Local anaesthetic Ropivacaine is favoured currently for epidural postoperative analgesia as it offers favourable sensory block profile. In comparison to other local anesthetics, it has a lower lipophilicity, which limits its penetration to the thin, pain-transmitting nerve fibers that are unmyelinated. It also has a lower incidence of cardiovascular damage (2,3). A centrally acting analgesic, tramadol is a synthetic counterpart of codeine. It has a mild affinity for kappa and delta receptors and a moderate affinity for mu receptors. When administered by way of an epidural, tramadol prolongs the duration of postoperative analgesia, displays decreased pain scores, and produces good sedative scores without having any respiratory depressive effects (4). In order to provide adequate postoperative analgesia, it has been utilized and is now being explored as an adjuvant to medicines used in epidural local anesthetics. The goal of this study is to compare the effectiveness of epidural ropivacaine and epidural ropivacaine combined with tramadol as postoperative analgesics in adult patients undergoing abdominal operations under general anaesthesia.

II. Aims And Objectives:

The aim of the study is to compare the postoperative analgesic (duration of analgesia) efficacy of epidural Ropivacaine and Ropivacaine with Tramadol in adults undergoing abdominal surgeries under general anesthesia. Secondary objectives are to compare:

- Ramsay sedation score
- Postoperative nausea and vomiting
- Pruritus
- Heart rate

III. Materials And Methods:

The study was a prospective non-randomized, double arm, single blinded, controlled study. The study was commenced after getting approval of Institutional Ethics Committee. The study was conducted in patients scheduled for abdominal surgeries done under general anesthesia at Government General Hospital, Guntur after obtaining written informed consent. Sample size was 60.

Inclusion criteria:

1) Patients posted for elective abdominal surgeries under GA
2) Between the ages of 30 and 60
3) Both sexes
4) Class I and II ASA
5) Those who have provided informed consent
6) Surgery was completed in less than three hours.

Exclusion criteria:

1) Patients not satisfying inclusion requirements.

2) Individuals who are sensitive to or allergic to the opioid medication class and local anaesthetics.
3) People with spinal deformities
4) Any indications against using epidural anaesthesia
The patients were equally and randomly divided into two group R (Ropivaine) and RT (Ropivacaine + Tramadol) of 30 each and compared for the variables. The data were entered into excel sheets and statistical analysis was done using Microsoft excel 2013.

IV. Results:

The mean age of the population was 43.05 ∓ 8.5 years. The mean age of R group was 42.1 ∓ 7.5 years and the mean age of RT group was 48.2 ∓ 4.6 years. In R group, 14 were males and 16 were females. In RT group, 16 were males and 14 were females. This difference is not significant at *p* value 0.75.

Duration of post-operative analgesia	Ropivacaine	Ropivacaine + Tramadaol
</= 240 minutes	28	0
241-300 minutes	2	11
300-360 minutes	0	19

Mean duration of post-operative analgesia in R group was 221.5 ∓ 20.2 minutes and the mean duration of post-operative analgesia in RT group was 310.2 ∓ 21.3 minutes. The difference is statistically significant with *p* value <0.05.
The mean Ramsay Sedation score in group R was 1.25 ∓ 0.46, whereas in group RT was 3.2 ∓ 0.13. The difference is statistically significant at p value <0.05.

PONV	Ropivacaine	Ropivacaine + Tramadol	P value
Yes	4	7	0.98
No	26	23	

The difference between both the groups in terms of PONV is not statistically significant at p >0.05.

Pruritis	Ropivacaine	Ropivacaine + Tramadol	P value
Yes	0	5	0.08
No	30	25	

The difference between pruritis between both the groups in terms of pruritis is not statistically significant at p >0.05.
The mean heart rate of R group was 75.6 ∓ 5.6 beats/minute and the mean heart rate of RT group was 76.5 ∓ 4.5 beats/minute. The difference is not statistically significant at p >0.05.

V. Discussion:

In the postoperative period, epidural analgesia makes the patient more comfortable in comparison to systemic analgesics. As a result, it promotes early patient ambulation and discharge while lowering morbidity. In this study, patients undergoing abdominal procedures under general anaesthesia were assessed to determine the effectiveness of epidural ropivacaine and ropivacaine combined with tramadol for postoperative analgesia. In this study, 60 patients between the ages of 30 and 60 were recruited. They were split into two groups, designated Group R and Group RT. 30 patients in Group R were given 10 ml of 0.2% ropivacaine epidurally. Thirty patients were given a 10ml solution containing 0.2% ropivacaine and 1 mg/kg of tramadol for Group RT.

The average time needed for postoperative analgesia in Group R was determined to be 221.5 minutes, but the average time needed in Group RT was 310.2 minutes. The enhanced mean duration of postoperative analgesia in Group RT compared to Group R was statistically significant according to an unpaired t-test because the p value was 0.0001. As a result, the Ropivacaine with Tramadol group's mean duration of postoperative analgesia was significantly longer than that of the Ropivacaine group.

We can fairly draw the conclusion from this study that, when utilised on individuals undergoing abdominal procedures under general anaesthesia, the mean duration of postoperative analgesia was considerably and consistently longer in the Ropivacaine with Tramadol group compared to the Ropivacaine group. This demonstrates unequivocally that ropivacaine and tramadol deliver longer-lasting anaesthesia than ropivacaine does on its own.

The average Ramsay sedation score for Group R was 1.25. The mean Ramsay sedation score for Group RT was 3.2 points. Given that the p-value for the unpaired ttest is 0.0001, the difference in scores between the

two groups was statistically significant. With a mean difference of 1.80 scoring points, the Ropivacaine plus Tramadol group's mean Ramsay sedation score was significantly higher than that of the Ropivacaine group.

Anil P. Singh et al. examined the effectiveness of two different dosages of tramadol (1 mg/kg and 2 mg/kg) as an adjuvant to 0.2% ropivacaine administered via epidural route in people undergoing upper abdominal operations under general anaesthesia. The findings showed that, when compared to the other two groups, the group that received 2 mg/kg of tramadol along with ropivacaine experienced a considerably longer mean duration of analgesia. Both doses were beneficial for postoperative analgesia, they found, although a 2 mg/kg dose of 0.2% ropivacaine produced superior analgesia of a longer duration, with a somewhat higher incidence of vomiting (5).

VI. Conclusion:

By extending the duration of analgesia and providing adequate sedation with no noticeable hemodynamic abnormalities, nausea, vomiting, or pruritus, the addition of 1 mg/kg of Tramadol enhances the postoperative analgesic efficacy of epidural 0.2% Ropivacaine.

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